

The present invention relates generally to improvements for a brassiere shoulder strap in which, more particularly, the improvements result in a seamless construction which contributes to the aesthetics and comfort of the strap.

As an article of manufacture, a brassiere strap is an assembly of superposed elongated fabric strips, each typically removed from a fabric panel and thus, unavoidably, each having raw cut edges occasioned by the removal. These edges require a finishing treatment, and the treatment of choice is to turn the raw cut edge inwardly upon itself. Adjacent thusly treated or finished edges is a manifested seam in the strap construction and is a shortcoming obviated in the seamless shoulder strap of the present invention.

#### Examples Of The Prior Art

A turned in fold of a brassiere elongated fabric strip may be located along a side edge of a shoulder strap construction, as exemplified by U.S. patent 4,638,513 for "Laterally Stabilized Bra Strap" issued to Woods on January 27, 1987, or located more frequently centrally of the strap surface in contact with the wearer's shoulder, as exemplified by U.S. patent 3,153,246 for "Embossed Shoulder Straps" issued to H. Silverman on October 20, 1964 and by U.S. patent 3,616,148 for "Laminated Shoulder Strap" issued to Irving Edelman on October 26, 1971. In being folded in, or under itself, the raw cut edge is removed from sight and touch, but the bulk of a two ply configuration resulting from the fold remains as a possible pressing source of discomfort against the shoulder of the wearer. Moreover, a cooperating pair of inturned folds are typically operatively arranged in facing or abutting relation to each other, thus forming a seam which both from an appearance and touch or "hand", i.e. the feel of fabric construction material of the strap, are undesirable.

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Broadly, it is an object of the present invention to provide a seamless brassiere shoulder strap construction overcoming the foregoing and other shortcomings of the prior art.

More particularly, it is an object in the assemblage of shoulder strap work-in-process fabric strips to remove the selvages thereof without imparting at the site of removal a raw cut nature to edges of the strips, thus obviating any need of seams, or of processing otherwise of the shoulder strap in any significant extent in order to avoid unsightliness and discomfort during wear, all as will be better understood as the description proceeds.

The description of the invention which follows, together with the accompanying drawings should not be construed as limiting the invention to the example shown and described, because those skilled in the art to which this invention appertains will be able to devise other forms thereof within the ambit of the appended claims.

Fig. 1 is a perspective view of a shoulder strap-supported brassiere;

Fig. 2 is an isolated partial sectional view, on an enlarged scale, of a prior art shoulder strap as might be typically used in the wearing support of the brassiere of Fig. 1; and

Fig. 3 is a perspective view, partially in phantom perspective, of a brassiere shoulder strap construction according to the present invention.

Shown in Fig. 1 is a brassiere, generally designated 1, having a front pair of breast-covering cups 2 and 3, and left and right shoulder straps 4 and 5 which are looped over the wearer's shoulders (not shown) for supporting the brassiere 1 during use. Each strap 4, 5 is of an elongated strip configuration having a width, typically approximately 1

inch wide, delimited by opposite side edges 6 and 7. When prepared as a work-in-process component, the fabric construction material of a strap 4, 5 is cut longitudinally while being urged in a machine direction during being unwound from a fabric source put up in a supply roll to a cutting station, and this results in a cut raw nature in the edges 6 and 7 exiting from the cutting station. Both aesthetically and to obviate a possible source of discomfort, the cut raw nature of the edges 6 and 7 require a finishing treatment.

As shown in Fig. 2, the common practice in the prior art of finishing the cut raw edges, individually and collectively designated 10, of an upper fabric strip 12 and lower fabric strip 14 is to turn in, as at 16 and 18, these edges so that outwardly facing semi-circular configurations, individually and collectively designated 19, are visible to satisfy the aesthetic requirement and are smooth to the touch to obviate any discomfort by contact. For completeness sake, it is noted that mono-filament threads 26, 28 in response to the application of heat are effective to bond the inturned edges 16 and 18 in place as illustrated in Fig. 2, and that the assembly per se is held in their cooperative Fig. 2 arrangement with each other by the fusion of a strip of synthetic plastic material in the form of a web of thermoplastic fibers 24 having an interposed operative position between filler fabric strips 20, 22, all as is described in U.S. patent 4,217,906 for "Shoulder Straps" issued to Perron on Aug. 19, 1980, the full text of which patent will be understood to be incorporated herein by this reference pursuant to MPEP 2163.07(b).

Underlying the present invention is the recognition that using to advantage a known heat sealing and cutting technique common in plastic bag-manufacturing, as exemplified by U.S. patent 5,711,751 for "Hermetic Seal For A Plastic Bag" issued to Harmanoglu on January 27, 1998, similarly incorporated herein by reference pursuant to

MPEP 2163.07(b), that raw cut edges of work-in-process edges of assembly fabric strips of a brassiere can be finished to aesthetic and comfort standards in a desirable "seamless" construction, wherein by "seamless" is meant without inturned edges which, unavoidably, are manifested bulk on opposite sides of a clearance defining the seam.

As best shown in Fig. 3, there is illustrated an isolated length portion of a brassiere seamless shoulder strap, generally designated 30, having a superposed cooperating pair of an upper 32 and of a lower 34 elongated strip of fabric construction material, the upper 32 being nylon or polyester for appearance and the lower possibly being a plain fabric, such as 40 denier tricot providing a softer, more velvety feel known in trade parlance as "plush", i.e. a fabric in which one surface has been processed by brushing or other means so as to raise a nap which, in this case, would contribute to comfort in wearing contact against the shoulder.

The upper and lower elongated fabric strips 32 and 34 by virtue of their facing relation to each other bound a correspondingly elongated internal compartment 36 and preliminarily are of selected width 38 which, as will be explained are narrowed in the final strap construction, but until such narrowing have raw cut edges 40. Positioned in the compartment 36 between the strips 32 and 34 is an intermediate strip 42 also having opposite cut raw edges 44 and of a slightly oversized selected width 46 presenting, by virtue of the differences in sizes 38 and 46, laterally outwardly extending opposite selvage edges 48. Intermediate strip 42 is, in the parlance of the trade, known as "stitchbond" and is a woven polyester fabric which is comprised of synthetic plastic material in the form of a web of thermoplastic fibers 50, similar to the previously noted construction of panel 24 of Fig. 2.

In the construction of the shoulder strap 30, using as previously noted the known heat sealing and cutting technique common in plastic bag-manufacturing, the assembled superposed arrangement of upper, intermediate, and lower fabric strips 32, 34 and 42 are urged in a machine direction 52 in processing relation past a rotary fusing or welding means 54 and past a rotary cutting means 56, the former producing side weld lines 58, and the latter removing from the assembly the opposite selvages 48 at the site of the weld lines 58 which, in practice has been found to be free of fraying or any other fiber manifestation detracting from a neat finished appearance in a cut and seal line 60 at the side locations of the shoulder strap 30. The resulting approximately 1 inch wide brassiere shoulder strap 30 is thus without a telltale seam but also with finished side edges 60. Optionally use can be made of a fusible web adhesive 62 commercially available from Spunfab/Keuschel Associates of Cayuga Park, Ohio to increase the bonding together of the Fig. 3 shoulder strap assemblage.

While the brassiere shoulder strap herein shown and disclosed in detail is fully capable of attaining the objects and providing the advantages hereinbefore stated, it is to be understood that it is merely illustrative of the presently preferred embodiment of the invention and that no limitations are intended to the detail of construction or design herein shown other than as defined in the appended claims.